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| NON-MEASUREMENT |  
| SENSITIVE |  
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MIL-STD-1840B

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SUPERSEDING  
MIL-STD-1840A  
22 DECEMBER 1987

## MILITARY STANDARD

### AUTOMATED INTERCHANGE OF TECHNICAL INFORMATION

Note: This 16 January 1992 draft, prepared by the OSD CALS  
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Project ILSS-O041

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### 1 SCOPE

1.1 Purpose. The purpose of this standard is to standardize the digital interface between organizations or systems exchanging digital forms of technical information necessary for the development and logistic support of defense systems throughout their life cycle. The initial areas addressed by this standard involved the interface with computer technologies which are automating the creation, storage, retrieval, and delivery of hard copy forms of technical manuals and engineering drawings. This revision of the standard also addresses electronic product data, new packaging of data for electronic trade business transactions, and electronic product data technology. Future revisions of this standard will address other emerging computer-based technologies, including solid modeling for system design, the interactive retrieval and use of technical information, expert systems (artificial intelligence), and other potential computer applications for defense systems of the future.

1.2 Application. This standard addresses technical information which is part of the traditional technical data package used for item acquisition, technical information used to design, manufacture and field an item, and the technical documentation used for item support. This includes information such as product data, product acquisition and implementation information; and product support data. Product data includes engineering drawings and specifications, but also includes new and evolving digital data forms that define parameters, features, and characteristics which enhance product functionality in a defense system and provide the data in a form directly usable by computer applications. Product acquisition and implementation information includes parameters, part numbers and codes, and other data necessary to manufacture, assemble and/or acquire the defense system, its supporting components, spares, and other equipment. Product support information includes training and maintenance manuals with their associated illustrations, and other data needed to bring the defense system to, and maintain, a required state of readiness. This military standard also standardizes the format and information structures of digital data files used for the transfer and archival storage of technical information in digital form. The format, information structures, and transfer procedures established herein are applicable in all cases where the information can be prepared and received in the form of ASCII text files, product definition data files, raster image files, or graphics files. The standard is not restricted in any way in its application.





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### 2 REFERENCED DOCUMENTS

#### 2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. Unless otherwise specified, the following specifications, standards, and handbooks of the issue listed in the current Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation, form a part of this standard to the extent specified herein. The documents referenced in the cited documents (first tier) form a part of this standard to the extent specified. All others are for guidance and information only.

#### SPECIFICATIONS

##### MILITARY

MIL-B-131 - Barrier Materials, Watervaporproof, Greaseproof, Flexible, Heat-sealable.

MIL-D-28000 - Digital Representation for Communication of Product Data: IGES Application Subsets

MIL-M-28001 - Markup Requirements and Generic Style Specification for Electronic Printed Output and Exchange of Text

MIL-R-28002 - Raster Graphics Representation in Binary Format, Requirements for

MIL-D-28003 - Digital Representation for Communication of Illustration Data: CGM Application Profile

#### STANDARDS

##### MILITARY

MIL-STD-454 - Standard General Requirements for Electronic Equipment

MIL-STD-804 - Formats and Coding of Aperture Cards.

MIL-STD-1806 - Marking Technical Data Prepared by or for the Department of Defense.

2.1.2 Other Government documents, drawings, and publications. The following other Government documents, drawings, and publications form a part of this standard to the extent specified herein.

FIPS PUB 146 - GOSIP



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(Copies of the referenced federal and military specifications, standards and handbooks are available from the Department of Defense Single Stock Point, Commanding Officer, Naval Publications and Forms Center (NPFC), 5801 Tabor Avenue, Philadelphia, PA 19120. For specific acquisition functions, these documents should be obtained from the contracting activity or as directed by the contracting activity. FIPS PUB documents are available to government agencies only from NPFC; non-government availability is from the National Technical Information Service.)

2.2 Other publications. The following documents form a part of this standard to the extent specified herein. Unless otherwise specified the issues of the documents which are DOD adopted shall be those listed in the issue of the DODISS specified in the solicitation. The issues of the documents that have not been adopted shall be those in effect on the date of the cited DODISS.

### AMERICAN SOCIETY FOR TESTING & MATERIALS

ASTM D 3951 - Standard Practices for Commercial Packaging

(Applications for documents should be addressed to the American Society for Testing & Materials, 1916 Race Street, Philadelphia, PA 19103)

### AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI X3.27-1987 - File Structure and Labeling of Magnetic Tapes for Information Interchange

ANSI X3.39-1986 - Recorded Magnetic Tape for Information Interchange (1600 CPI, P.G.

ANSI X3.4-1986 - American National Standard Code for Information Interchange (ASCII)

ANSI X3.54-1986 - Recorded Magnetic Tape for Information Interchange (6250 CPI, Group coded Recording

(Application for documents should be addressed to American National Standards Institute, 11 West 42nd Street, 13 Floor, New York, NY 10036)

### INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE)

IEEE 1076 - VHSIC Hardware Description Language (VHDL)

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(Application for documents should be addressed to The  
Institute of Electrical and Electronics Engineers, Inc.,  
345 E. 47th Street, New York, 10017)

ELECTRONIC INDUSTRIES ASSOCIATION (EIA)

EIA 548 - Electronic Design Interchange Format  
(EDIF) and related publications:

EIA/EDIF -1 - Introduction to EDIF  
EIA/EDIF -2 - EDIF Connectivity  
EIA/EDIF-AF-1 - Applications Guide Using  
EDIF 2.0 for Schematic  
Transfer

and VHDL related publications:

EIA-AP-2229 - Commercial Component Model Specification  
EIA/VHDL TBD - Blank Detail Specification  
EIA/VHDL TBD - Timing Module Specification  
EIA/VHDL TBD - Engineering practices for the Quality  
Assurance of Standard Part Models from  
External Sources

Application for documents should be addressed to the  
Electronic Industries Association, Washington, DC)

INSTITUTE FOR INTERCONNECTING AND PACKAGING ELECTRONIC CIRCUIT  
(IPC)

IPC-D-350 - Printed Board Description in Digital Form  
IPC-D-351 - Printed Board Drawings in Digital Form  
IPC-D-352 - Electronic Design Data Description for  
Printed Boards in Digital Form  
IPC-D-353 - Automatic Test Information Description in  
Digital Form  
IPC-D-354 - Library Format Description for Printed  
Board Digital Form  
IPC-D-355 - Printed Board Automated Assembly  
Description in Digital Form

(Application for documents should be addressed to the  
Institute for Interconnecting and Packaging Electronic  
Circuits, 7380 N. Lincoln Ave., Lincolnwood, IL 60646,  
708-677-2850)

Non-government publications are generally available for reference  
from libraries and technical groups.

2.3 Order of precedence. In the event of a conflict between the  
text of this standard and the references cited herein, the text of

this standard shall take precedence.

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### 3 DEFINITIONS

#### 3.1 Definitions of terms.

3.1.1 Acceptance testing. The testing performed by a user to determine that an automated system (equipment or software) for a specific task or environment, e.g., a translator for a specific application and interchange format, performs according to specification.

3.1.2 Application profile for CGM. A defined set of specific entity types, and their constraints, which are used to completely and unambiguously represent the information requirements for a particular application.

3.1.3 Application Protocol. Defines the context for the use of product data and specifies the use of the standard in that context to satisfy an industrial need.

3.1.4 Application subset for IGES. A defined set of specific entity types which are used to completely and unambiguously represent the information requirements for a particular application.

3.1.5 ASCII. American Standard Code for Information Interchange used extensively in data transmission. The code includes 128 upper and lower case letters, numerals and special purpose symbols, each encoded by a unique 7-bit binary number.

3.1.6 ASCII text. A sub-set of the ASCII, common to all computer devices, consisting principally of the printable characters.

3.1.7 Body. Contains the central part of the document as distinct from front and rear matter. In the case of technical publications, the body is presented in some form of logical hierarchy consistent with the applicable specification for that type of document.

3.1.8 Box. An assembly of one or more boards to implement a complex function. Includes back-plane or bus-oriented assemblies, as well as direct-connect assemblies of boards or substrates. Examples are the CPU box of a computer and front-end of a radar.

3.1.9 Component. Items that are usually packaged as an indivisible unit, to be assembled on a board or substrate. Examples include IC's, resistors, capacitors, inductors, transformers, discrete transistors, DIP switches, fuses, and encapsulated relays.

3.1.10 Computer Aided Design (CAD). A process which uses a computer system to assist in the creation, modification and display of a design.





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3.1.11 Computer Graphics Metafile (CGM). Standard for the description, storage, and communication of graphical information in a device-independent, computer-processable manner.

3.1.12 Descriptive markup. Markup that describes the structure and other attributes of a document in a non-system-specific manner, independently of any processing that may be performed on it. In particular, it uses tags to express the element structure.

3.1.13 Destination system. The computer hardware and software system receiving transferred data.

3.1.14 Digital data. Data represented in discrete discontinuous form as contrasted with analog data represented in continuous form.

3.1.15 Document. The term "document" applies to the information content of a variety of different printed or digital entities that contain technical information. These entities may be technical manuals, drawings, specifications, lists, engineering change notices, or other information, relating to the design, acquisition, manufacture, test, inspection, or maintenance of items. Technical information in digital form varies in its ability to be processed further while maintaining fidelity and integrity with the source data or product data it represents. Within this standard, use of the word "document" should be interpreted in that context (i.e., To what extent is it maintained as the source data for certain information).

3.1.16 Declaration file. A file accompanying any set of transferred files comprising a document; provides all information necessary to the successful disposition of the digital files at the destination, but has no purpose beyond that function.

3.1.17 Document type. A class of documents having similar characteristics; for example journal, article, technical manual, or memo.

3.1.18 Document type declaration. A markup declaration that contains the formal specification of a document type definition.

3.1.19 Document type declaration set. Rules, determined by an application, that apply Standard Generalized Markup Language (SGML) to the markup of documents of a particular type. A document type declaration set includes a formal specification, expressed in a document type declaration, of the element types, element relationships and attributes, and references that can be represented by markup. It thereby defines the vocabulary of the markup for which SGML defines the syntax.

3.1.20 Drawing. A specific type of engineering data that discloses, either directly or by reference, by means of pictorial

or textual presentations, or combinations of both, the physical and functional end-product requirements of an item.

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3.1.21 Electronic Data Interchange Format (EDIF). A neutral format for the interchange of integrated circuit design data from design to manufacturing organizations.

3.1.22 Engineering data. Any technical data (whether prepared by the government, contractor, or vendor) relating to the specification, design, analysis, manufacture, acquisition, test, inspection, or maintenance of items or services. All information which contains authoritative engineering definition or guidance on material, constituent items, equipment or system practices, engineering methods, and processes comprises engineering data.

3.1.23 Engineering drawing. See "drawing".

3.1.24 File. A digital repository of organized information consisting of records, items or arrays, and data elements.

3.1.25 File set. The collection of files which comprise a complete document.

3.1.26 Format. A specific arrangement of data.

3.1.27 Front matter. That portion of a document that precedes the body of the document and may consist of one or more of the following: cover page, title page, list of effective pages, record of changes, foreword, preface, safety warnings, table of contents, and lists of tables and illustrations.

3.1.28 Illustration.- A picture, graph, diagram, or other form of graphical representation contained within a technical publication.

3.1.29 Initial Graphics Exchange Specification (IGES). A neutral file format for the representation and transfer of product definition data among CAD/CAM systems and application programs.

3.1.30 Institute for Interconnecting and Packaging Electronic Circuits. Trade association and ANSI approved standards body which has developed printed circuit board standards.

3.1.31 Markup. SGML tags that are added to the data of a document in order to convey information about it.

3.1.32 Metafile. A mechanism for retaining and transferring graphical data and control information. The information contains a device independent description of one or more graphic images.

3.1.33 Office Document Architecture/Office Document Interchange Format (ODA/ODIF). An explicit document architecture and interchange format standard which allows exchange of compound documents (i.e., documents composed of various content types, such as character, raster graphics, and geometric (computer) graphics

content).

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3.1.34 Page Description Language (PDL). A programming language to describe the displayable appearance of a page containing text, graphics, and sampled images. Used to communicate a high level, device independent description of a document between a composition system and a display system.

3.1.35 Pixels. Physical picture elements.

3.1.36 Product Data Exchange Specification/Standard for the Exchange of Product Data (PDES/STEP). Standards (under development) for communicating a complete product model with sufficient information content so as to be interpretable directly by advanced CAD/CAM applications such as generative process planning, CAD directed inspection, and automatic generation and verification of NC Cutter path data. STEP is being developed as the international standard under the sponsorship of ISO TC 184/SC4.

3.1.37 Product data. All engineering data, in processable form, necessary to define the geometry, the function, and the behavior of an item over its entire life span. The term includes logistic data elements for quality, reliability, maintainability, topology, relationship, tolerances, attributes, and data elements necessary to completely define the item for the purpose of design, analysis, manufacture, test, and inspection.

3.1.38 Product definition data. Denotes the totality of data elements required to completely define a product. Product definition data includes geometry, topology, relationship, tolerances, attributes and features necessary to completely define a component part or an assembly of parts for the purpose of design, analysis, manufacture, test, and inspection.

3.1.39 Raster. The closely spaced parallel lines produced on a display device. An image is formed by modulating the intensity of the individual pixels. A binary representation, "raster form," of the pixels can be used to digitally represent an image.

3.1.40 Raster graphics. The presentation or storage of images in raster forms.

3.1.41 Rear matter. That portion of a document that follows the body and may consist of one or more of the following: appendices, indexes, and glossaries.

3.1.42 Record. A collection of related items of data, treated as a unit.

3.1.43 Source system. The computer hardware and software that will structure technical information for interchange in accordance with this standard.



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3.1.44 Special word file. A file of words which are contained in the accompanying document file, but are not expected to exist in a standard xxxxx file for automated spell checking.

3.1.45 Standard Generalized Markup Language (SGML). A standard that defines a language for document representation which formalizes markup and frees it of system and processing dependencies. It provides a coherent and unambiguous syntax for describing whatever a user chooses to identify within a document.

3.1.46 System. Specific suite of computer hardware and software. As used in the terms "Source System" and "Destination System," the term does not necessarily correspond one to one with "site" or "base" in that most prime contractor sites and DoD installations have more than one system.

3.1.47 Tape set. A group of one or more magnetic tapes which collectively represent the collection of related files comprising a specific delivery of a document or documents.

3.1.48 Tape volume. A single reel of magnetic tape with recorded data.

3.1.49 Test data. A set of data developed specifically to test the adequacy of a computer or system.

3.1.50 Validation. The process of checking the format and the structure of a MIL-STD-1840 file set against the requirement of this standard.

3.1.51 Vector graphics. The presentation of images stored as vector or other mathematical representations.

3.2 Acronyms and abbreviations used in this standard.

ANSI American National Standards Institute

ASCII American Standard Code for Information Interchange

ATOS Automated Technical Order System

CAD Computer Aided Design

CAD/CAM Computer Aided Design and Computer Aided Manufacturing

CALS Computer-aided Acquisition and Logistic Support

CAM Computer Aided Manufacturing

CDRL Contract Data Requirements List

CGM    Computer Graphics Metafile



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CPI	Characters Per Inch
DDN	Defense Data Network
DODISS	Department of Defense Index of Specifications and Standards
ECN	Engineering Change Notes
EDIF	Electronic Design Interchange Format
EIA	Electronic Industries Associations
FIPS	Federal Information Processing Standard
FOSI	Formatting Output Specification Instance
GOSIP	Government Open Systems Interconnection Profile
IEC	International Electrotechnical Commission
IGES	Initial Graphics Exchange Specification
IEEE	Institute of Electrical and Electronics Engineers
IPC	Institute for Interconnecting and Packaging Electronic Circuits
ISO	International Organization for Standardization
NIST	National Institute of Standards and Technology
NC	Numerical Control
ODA/ODIF	Office Document Architecture/Office Document Interchange Format
PDES	Product Data Exchange Specification
PDL	Page Description Language
PE	Phase Encoded
SC	Subcommittee
SGML	Standard Generalized Markup Language
STEP	Standard for the Exchange of Product Model Data
TC	Technical Committee

TCP/IP Transmission Control Protocol/Internet Protocol

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VHDL    VHSIC Hardware Description Language

VHSIC    Very High Speed Integrated Circuit



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### 4 GENERAL REQUIREMENTS

4.1 Document types. This standard covers the following types of documents delivered in digital form:

- a. Technical Publication or Manual (pictorial and textual data)
- b. Product Data

4.1.1 Technical publications. Technical publication information covered by this standard consists of text and associated illustrations in digital form. This information shall be organized into file sets. Each requisite file of a set shall be encoded in a format specified by the contract or other form of agreement, and be accompanied by the applicable data file header records (see Section 5).

4.1.1.1 Technical Publication File Sets. The file sets which comprise a technical publication document shall be as specified for each of the following forms of delivery:

4.1.1.1.1 Raster Page Image File Set. The file set of a technical publication containing Raster Page Image files shall consist of the following:

- a. A Declaration File
- b. Raster Page Image files (at least one Raster Page Image file per document, mandatory). Each file shall be accompanied by identifying data file header records.

4.1.1.1.2 Page Description Language (PDL) File Set. The file set of a technical publication containing PDL files shall consist of the following:

- a. A Declaration File
- b. PDL files as specified by contract or other form of agreement (at least one PDL per document, mandatory). Each file shall be accompanied by identifying data file header records.

4.1.1.1.3 SGML Conforming File Set. The file set of a technical publication containing SGML Conforming files shall consist of the following:

- a. A Declaration File
- b. SGML coded Text Source files (at least one text

source file per document, mandatory). Each file shall be accompanied by identifying data file header

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records. The conforming text file will contain external reference tags to registered file ID's (see 5.1.4) for DTD and FOSI.

- c. SGML text entity files as needed to support entity references for the document.
- d. Illustration Data Files in IGES format, CGM format or Raster format, as specified by contract or other form of agreement. Each file shall be accompanied by identifying data file header records.

4.1.1.1.4 SGML Non-conforming File Set. The file set of a technical publication document containing SGML Non-conforming Files shall consist of the following:

- a. A Declaration File
- b. SGML coded Text Source Files (at least one text file per document, mandatory). Each file shall be accompanied by identifying header records.
- c. SGML text entities supporting entity references.
- d. Illustration Data Files in IGES Format, CGM Format or Raster Format, as specified by contract or other form of agreement. Each file shall be accompanied by identifying data file header records.
- e. Document Type Declaration Set Data File (one file per document, mandatory). The file shall be accompanied by identifying data file header records.
- f. Non-conforming Formatting Output Specification Instance (FOSI) Data File (one file per document, mandatory). The file shall be accompanied by identifying data file header records.

4.1.1.1.5 Special Word Data File. The special word file provides the means for transferring a file of words peculiar to the document to which it is related, and which may not be in the destination system lexicon. This file may be used to facilitate other, as yet undefined, supporting textual information.

4.1.1.2 Technical Publication File Formats. The format of the technical publication files shall be as follows:

4.1.1.2.1 Declaration File Format. The declaration file shall be in 7-bit ASCII as specified by ANSI X3.4 and uniquely identify the delivered document. The declaration file shall be prepared in accordance with the requirements of section 5 of this standard and

there shall be one declaration file with each document delivered in digital form. Declaration Files shall only contain the characters



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in columns 2, 3, 4, 5, 6, and 7 of the ASCII code table in ANSI X3.4, except for the Delete (DEL) character in position 7/15 which shall not be used.

4.1.1.2.2 Text Source File Format. The text source files shall be ASCII, SGML coded text files tagged in accordance with MIL-M-28001, as specified by the contract or other form of agreement.

4.1.1.2.3 Document Type Declaration Set File Format. The document type declaration set file shall contain, for a document, the complete set of declarations which defines its structure and content as specified in MIL-M-28001 or in a military specification required for publication per the contract or other form of agreement. The document type declaration set may alternatively contain the PUBLIC document type declaration which refers to a PUBLIC document declaration set.

4.1.1.2.4 SGML Text Entity File Format. The file shall contain the content of the text entity according to MIL-M-28001. The content may be a "PUBLIC" entity content or a source external entity content. If it is a PUBLIC entity the file may contain only the PUBLIC entity name and reference.

4.1.1.2.5 Formatting Output Specification Instance (FOSI) Data File Format. The FOSI file shall be in accordance with MIL-M-28001, and shall define the style and format of the document specified in the contract or other form of agreement.

4.1.1.2.6 Illustration Data File Format. Each set of text source files for a technical publication shall be supported with an illustration data file for each illustration in the technical publication except where there are multiple instances of the same illustration in different locations of the technical publication. In this situation, a single illustration file may be used to satisfy all of the illustration instances. The illustration data files shall contain digital data encoded in IGES, RASTER, or CGM format. Each illustration data file shall be accompanied by identifying header records (see section 5).

4.1.1.2.6.1 IGES Illustration Data File Format. IGES Illustration Data Files shall be in accordance with the requirements of MIL-D-28000, and shall be Class I or Class II application subsets as specified by the contract or other form of agreement.

4.1.1.2.6.2 Raster Illustration Data File Format. Raster Illustration Data Files shall be in accordance with the requirements of MIL-R-28002.

4.1.1.2.6.3 CGM Illustration Data File Format. CGM Illustration Data Files shall be in accordance with the requirements of MIL-D-28003.



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4.1.1.2.7 PDL Data Files. PDL Data Files shall be as specified in the contract or other form of agreement.

4.1.1.2.8 Grey Scale or Color Illustration Data File Format. Requirement for half-tone or color illustration will be as specified in the contract or other form of agreement.

4.1.1.2.9 Special Word Data File Format. Special Word Data Files shall be as specified by contract or other form of agreement.

4.1.1.2.10 Raster Page Image File Format. Raster Page Image Files shall be in accordance with the requirements of MIL-R-28002.

4.1.2 Product data. Product data covered by this standard consist of engineering and system support data encoded in IGES or raster format as specified by the contract or other form of agreement. The files of a Product Data document consist of:

- a. A declaration file, in 7 bit ASCII, which uniquely identifies the document (one declaration file per document, mandatory).
- b. Engineering drawing data files in IGES or raster format as specified by the contract or other form of agreement, accompanied by identifying header records;
- c. Electrical/electronic application data files as specified in 4.1.2.3, accompanied by identifying header records; or
- d. Numerical control manufacturing data files.

(Future revisions of this standard will address product data files in STEP format.)

4.1.2.1 Declaration files. Declaration files shall be prepared in accordance with the requirements of section 5 of this standard.

4.1.2.2 Engineering drawing data files. The engineering data file representations of engineering drawings shall be only IGES or raster files. The specific form of the transferred files shall be as specified by the contract or other form of agreement.

4.1.2.2.1 IGES engineering drawing data files. IGES engineering drawing data files shall be Class II application data subsets as specified by MIL-D-28000.

4.1.2.2.2 Raster engineering drawing data files. Raster engineering drawing data files shall be as specified by MIL-R-28002.

4.1.2.3 Electrical/Electronic application data files.

Electrical/Electronic application data files shall be delivered in

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one or more of the following file formats as specified by the contract or other form of agreement.

### 4.1.2.3.1 Electronic Design Interchange Format (EDIF).

Electrical/Electronic application data files of this form shall be delivered in accordance with the EDIF product description and file format standard as defined in EIA 548.

4.1.2.3.2 VHSIC Hardware Description Language (VHDL). Electronic application data files of this form shall be delivered in accordance with the VHDL product description and file format standard as defined in IEEE-STD-1076. Application protocol will be in conformance with the following, in descending order of precedence:

- a. Appendix A of this standard.
- b. The industry application protocol EIA-AP-2229 - Commercial Component Model Specification

4.1.2.3.3 IGES Electrical/Electronic Application Data Files. These files shall be Class III application data subsets as specified by MIL-D-28000.

4.1.2.3.4 Institute for Interconnecting and Packaging Electronic Circuits (IPC). Electrical/Electronic Application Data Files of this form shall be delivered in accordance with the IPC product description and file format standard as specified by IPC-D-350 through IPC-D-355.

4.1.2.4 Numerical control manufacturing. Numerical control data files shall be Class IV application data subsets as specified by MIL-D-28000.



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### 5 DETAILED REQUIREMENTS

5.1 File structure for transfer. This section specifies the structure, content, and order of the digital information that accompanies and describes the content of a group of files that comprise a document to be interchanged. The group of files shall consist of:

- a. one declaration file
- b. at least one data file.

The declaration file shall precede the data files of a document. If more than one document is transferred in a single transaction, all of the declaration files shall be grouped at the beginning of the sequence of files in order to facilitate locating specific documents. The group of files for a specific technical publication or product data document may be in any order, but the group must be contiguous. On magnetic tape the document file groups shall follow the declaration files in the same order in which their related declaration files occur.

5.1.1 Declaration file. The declaration file provides information about the identifications, source, destination, classification, etc. of the document and gives a count of the files in the set of files that make up the complete document.

5.1.1.1 Declaration file name. The file name for a declaration file shall be four characters long, with the first character being "D" and the next three characters being the ASCII representation of an identifier for the document. For multiple file sets transferred as a group, this identifier shall begin as "001" and shall be incremented as follows for each document being transferred in order to provide each document with a unique declaration file name:

D001, D002...D999, DA01...DA99, DB01...DW99, DY01...DY99  
The letters "I, O, Q, S, X, and Z" shall not be used.

5.1.1.2 Declaration file content. The records specified in this section are all required. When circumstances dictate that there is no relevant data to place in a record, the ASCII string "NONE" shall be used. Each record shall have a record identifier as the first characters in the record; the last character in the identifier string shall be a colon and a space character. In the following description of the records, the record identifier that shall be used is found enclosed in parentheses immediately following the record type. (The "Record" number is for the convenience of the reader of this standard and is not a part of the record.) The declaration file records are:

RECORD 1. - Source system (srcsys:). A character string

containing the name, address, and other information needed to identify the system from which the information originated.



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RECORD 2. - Source system document identifier (srcdocid:). The character string used by the source system to uniquely identify a document, e.g., a technical publication number, engineering drawing number, or database file set identifier.

RECORD 3. - Source system related document identifier (srcrelid:). A character string used by the source system to identify another document to which this document is closely related (e.g., this document is a supplement to another document).

RECORD 4. - Highest revision and change level in the document (chglvl:). A character string indicating the revision, change level, and date of this document. If no changes have been incorporated this record should contain the word, "ORIGINAL". Date format shall be YYYYMMDD, where YYYY is the year, MM is the month, and DD is the day of the month.

RECORD 5. - Date of issue of the latest change to the document (dteisu:). If the document is an original, this shall be the date of issue of the document. Date format shall be YYYYMMDD, where YYYY is the year, MM is the month, and DD is the day of the month.

RECORD 6. - Destination system (dstsys:). A character string containing the name, address, and other information needed to identify the destination system to which the document is going.

RECORD 7. - Destination system document identifier (dstdocid:). A character string used by the destination system to uniquely identify this document; this shall be the service or agency document number, e.g., a technical publication number or title, engineering drawing number, or database file set name.

RECORD 8. - Destination system related document identifier (dstrelid:). A character string used by the destination system to identify another document to which this document is closely related (e.g., this document is a supplement to another document).

RECORD 9. - Date of transfer (dtetrn:). The date the document was transferred by the source system to the transmission media. Date format shall be YYYYMMDD, where YYYY is the year, MM is the month, and DD is the day of the month.

RECORD 10. - Delivery accounting (dlvacc:). Free form record giving delivery information specified by the contract or other form of agreement., such as contract number, CDRL item, etc.

RECORD 11. - File count (filcnt:). A character string count of the numbers of each type of data files in the document.

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Precede each file count with the letter from table I, used in the "data file name" to identify the type of file. Separate each number with a comma, except for the last. Spaces may be used as additional separators after each comma. For example, a record containing the string "T8, Q4, C1, R1" would indicate the document includes eight text files, four IGES files, one CGM file, and one raster illustration file. If there are no files of a particular type in a document, then the letter and file count are omitted.

RECORD 12. - Title Security Label (ttlcls:). A character string stating the security/sensitivity level or other restrictions on the title of the document.

RECORD 13. - Document Security Label (doccls:). A character string stating the highest security/sensitivity level or other restrictions on any file in the document.

RECORD 14. - Document Type (doctyp:). A character string used by the source system to uniquely identify a document or engineering drawing type, e.g. job guide, schematic diagram, work card, or assembly drawing.

RECORD 15. - Document Title (docttl:). A character string identifying the document, e.g., a technical publication or engineering drawing title.

5.1.1.3 Declaration file format. The content and format of data appearing in Records 1, 2, 3, 4, 6, 7, 8, 10, and 12 will be specified by contract or other agreement prior to actual transmission of documents. An example of a declaration file is shown in figure 1.

5.1.2 Data file type. The data files may be of the types shown in table I and shall be as specified below. Required data files not specified below shall be as specified by the contract or other form of agreement.

- a. Text files: 7 bit ASCII, as specified by ANSI X3.4, and tagged in accordance with MIL-M-28001, containing the front and rear matter and the body of the document text. The text file may or may not contain the DTD file. The file may contain a partial document.
- b. Illustration files: IGES format, CGM format, or raster format; containing the illustrations for the document.
- c. Product data files: IGES format, raster format, VHDL format, EDIF format, or IPC format.
- d. Page image files: raster format.

e. Contract Defined data and format.

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- f. Other files: a DTD or FOSI file shall be 7 bit ASCII as specified by ANSI X3.4. A special word file shall be as specified by the contract or other form of agreement.

TABLE I Data file name code letters (Fifth character in a data file name).	
Code Letter	Data File Type
T	Textual file.
G	Document Type Declaration Set file with no contained text data.
H	Format Output Specification Instance (FOSI) file.
N	SGML Text Entity File.
Q	IGES file.
R	Raster file.
C	CGM file.
E	EDIF file
I	IPC file
V	VHDL file
X	Special word file.
P	PDL file.
Z	Gray Scale Data.
A	Contract Defined Data



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```
+-----+
| srcsys: AJAX Inc. 100 Doe St., San Diego, CA 92110 |
| srcdocid: Benchmark 14 |
| srcrelid: Benchmark 12 |
| chglvl: 1 |
| dteisu: 19810801 |
| dstsys: ATOS System, Hill Air Force Base, UT 84056 |
| dstdocid: 4SA6-11-4 |
| dstrelid: 4SA6-11 |
| dtetrn: 19850710 |
| dl vacc: CDRL item 6 of Contract 1XYZ1085, DUE 31JUL85 |
| filcnt: T8, Q4, C1, R1 |
| ttlcls: Unclass |
| doccls: Unclass |
| doctyp: A character string |
| docttl: A character string |
+-----+
```

FIGURE 1. Example of a declaration file.

5.1.3 Data file name. The file name for data files shall be eight characters long, with the first four characters being the same as the declaration file name ("D001" to "DZ99"). The fifth character shall be a code letter from table I identifying the type of data file. The last three characters shall be a character representation of an identifier from "001" to "Z99". The first data file for a document shall use "001" and the identifier shall increment sequentially for each data file of the document, as discussed in paragraph 5.1.1.1, so that each file has a unique file name represented by the first four and last four characters of the eight character string.

### Note:

Each data file name includes the declaration file name as the first four characters in order to facilitate the reconstruction of the transmitted "document." The file naming convention described for the declaration file and the data files is intended to provide the declaration file and the files of the document with "in transit" labels, and are not intended to place constraints on the file naming conventions used in the source system, nor to have a life beyond the point where the destination system has assimilated the document into its own database.

5.1.4 Data file header records. Each data file shall have identifying header records in 7 bit ASCII and as specified by this section. The records shall only contain the characters permitted by ANSI X3.27. Table II specifies which records are required for each data file type; those records which shall accompany the file are identified. The header record block within fixed length files shall be padded out to the desired length by the use of the

circumflex accent ("^") characters (position 5/14 of the ASCII table). The required records for which there is no applicable



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data shall contain the text string, "NONE". Each record shall have the record identifier string of table II as the first characters in the record; the last two characters in the record identifier string shall always be a colon and then a space character. The following is a complete list of all possible data file header record identifiers. Each record identifier is followed in table II by a description of the record and the specific restrictions on the content of the record. Though not all are used, data file header records shall always occur in the order in which they are presented below:

srcdocid: - Source system document identifier. This is a character string used by the source system to uniquely identify this document, e.g., the technical publication number, to which this file belongs, comprises, or applies.

- a.) For a DTD data file, the document, e.g., the technical publication number, to which the DTD is applicable.
- b.) If an illustration or figure, the technical publication which references an IGES, raster, CGM, or other representation of an illustration, IAW this specification.
- c.) If a text data file owns, references, or is an application of this file, then this record is identical to header record 1 of that text data file, and to record 2 of the declaration file of both that text file and this file. When there are multiple references to this file throughout the text data files, the contents of this record shall be the same as header record 1 of the text data file in which the first occurrence of the reference is found.
- d.) For product data this record shall be in accordance with 5.1.5.

dstdocid: - Destination system document identifier. A character string containing the service or agency document identifier, e.g., the technical publication number, to which this file belongs, comprises, or applies. These files include:

- a.) The technical publication to which a DTD or FOSI is applicable.
- b.) The technical publication which references an IGES, Raster, CGM, or other representation of a table or illustration, IAW this specification.

This record is identical to header record 2 of the text data file that owns, references, or is an application of this file, and to

record 7 of the declaration file of both that text file and this file. When there are multiple references to this file throughout

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the text data files, the contents of this record shall be the same as record 3 of the text data file in which the first occurrence of the reference is found.

txtfilid: - Text file identifier. For textual files this record shall contain the code, from table III, identifying the content of this file according to the subdivision scheme chosen. For illustration and other data files referenced by a text file the contents of this header record shall be identical to header record 3 of the text file which references this illustration. For product data enter the character string, NONE.

regfilid: - Registered File Identifier. This record shall contain a unique identifier for this file assigned by the DoD registration authority, or if not applicable, identifier composed of a CAGE code and a alpha numeric identifier unique to the preparing organization. This includes:

- a.) Document Type Declaration set files.
- b.) Format Output Specification Instance files.
- c.) SGML text entity files (registered identification or unique identifier).

If the data file is not registered, the character string "NONE" shall be entered. If the data file is registered, the entry in this record shall be the registered identifier and the registered portion of the file may be replaced by a public identifier tag.

pntfilid: - Parent file identifier. For data files referenced by another data file, the contents of this record shall be identical to dstdocid: record 2 data file which references this illustration or drawing. For illustration files associated only with technical publications or product data not associated with any other data file, enter the character string, NONE.

datfilid: - Data file identifier. This record shall contain the contract-specified description, identifying the content and processing of this file. For example, the contract requires this record to indicate the type of processing needed to use the data.

srcgph: - Source system graphics filename. For technical publication, the string value found with the required attribute "boardno" in the tag "<graphic...>". For product data, enter the character string, NONE. It is recommended that this record contain the original source system subordinate filenames. When a document is subdivided, this record will preserve the original filename. Trouble shooting may depend entirely on this data at times and often these names will have significance on the destination system as well. It will also permit the receiver to avoid having to synthesize unique and filenames.

rtype: - Raster data type. A single numerical character representing the type of raster data contained in the binary values

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that follow the header records. The character "1" indicates type I raster data as defined in MIL-R-28002. The character "2" indicates type II raster data as defined in MIL-R-28002.

rorient: - Raster image orientation. Two, right-justified, three character strings separated by a comma specifying respectively the direction of the progression of successive pels along a line relative to the horizontal and the direction of the progression of successive lines relative to the pel path. Permissible and default pel path and line direction values are listed in MIL-R-28002.

rpelcnt: - Raster image pel count. Two, right-justified, six character strings separated by a comma specifying the integer count of pels in the pel path direction, and lines in the line progression direction.

rdensity: - Raster image density. One, right-justified, four character string representing the numerical value of the raster image density. Permissible and default image density values are listed in MIL-R-28002.

didfilid: - Data Item Description file identifier. This record shall contain the code, from the applicable Data Item Description, identifying the content of this file according to the subdivision scheme chosen therein.

doccls: - Data File Security Label. Character string stating the security/sensitivity level or other restrictions on the data file.

notes: - Notes. Notes shall consist of free form text consistent with the number of characters permitted for records in this file.

5.1.4.1 Textual data file header records. The file header records for the SGML, textual data files shall contain the mandatory records shown in table II.

5.1.4.2 Document Type Definition data file header records. The file header records for the Document Type Definition data files shall contain the mandatory records shown in table II subject to the following:

Registered File Identifier (regfilid:). This record shall contain a unique identifier for this DTD. Assignment of this unique DTD identifier shall be as specified in MIL-M-28001.

5.1.4.3 IGES data file header records. The file header records for the IGES data files shall contain the mandatory records shown in table II.

5.1.4.4 Raster data file header records. The file header records for the raster data files shall contain the mandatory records shown in table II.



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TABLE II Record Identifiers.									
DATA FILE HEADER				DATA FILE CODE LETTER (See table I)					
RECORD NAME / DESCRIPTION				T	G	H	Q	R	C   P
srcdocid: Source system document identifier	M*	M*	M*	M*	M*	M*	M*	M*	M*
dstdocid: Destination system document identifier	M*	M*	M*	M*	M*	M*	M*	M*	M*
txtfilid: Text file identifier	M	NA	NA	M(I*)	M(I*)	M*	M*	M*	M*
regfilid: Registered File Identifier	NA	M	M	NA	NA	NA	NA	NA	NA
pntfilid: Parent file Identifier	O*	NA	NA	O*	O*	O*	NA	NA	NA
datfilid: Data file identifier	NA	NA	NA	NA	NA	NA	NA	NA	NA
srcgph: Source system graphic filename	NA	NA	NA	M(I)	M(I)	M	NA	NA	NA
rtype: Raster data type	NA	NA	NA	NA	M	NA	NA	NA	NA
rorient: Raster image orientation	NA	NA	NA	NA	M	NA	NA	NA	NA
rpelcnt: Raster image pel count	NA	NA	NA	NA	M	NA	NA	NA	NA
rdensty: Raster image density	NA	NA	NA	NA	M	NA	NA	NA	NA
didfilid: Data Item Description file identifier.	NA	NA	NA	NA	NA	NA	NA	NA	NA
doccls: Document Security Label	M	NA	NA	M	M	M	M	M	M
notes: Notes	M	M	M	M	M	M	M	M	M

Legend:

O - Optional

M - Mandatory

(I) - Mandatory only when file is a technical publication illustration

\* - Must be identical to the corresponding Declaration File Record

NA - Not Applicable

Note: If no data for a mandatory field, the word "None" must be entered



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TABLE II Record Identifiers (continued).									
DATA FILE HEADER				DATA FILE CODE LETTER (See table I)					
RECORD NAME: DESCRIPTION				Z	Y	E	V	I	CONT  N
srcdocid: Source system	M*	M*	M*	M*	M*	M*	M*	M*	
document identifier									
dstdocid: Destination system	M*	M*	M*	M*	M*	M*	M*	M*	
document identifier									
txtfilid: Text file identifier	M*	NA	NA	NA	NA	NA	NA	NA	
regfilid: Registered File Identifier	NA	NA	NA	NA	NA	NA	NA	M	
pntfilid: Parent file Identifier	NA	NA	O*	O*	O*	NA	NA	NA	
datfilid: Data file identifier	NA	NA	NA	NA	NA	M	NA	NA	
srcgph: Source system graphic filename	M	NA	M	M	M	NA	NA	NA	
rtype: Raster data type	NA	NA	NA	NA	NA	NA	NA	NA	
rorient: Raster image orientation	NA	NA	NA	NA	NA	NA	NA	NA	
rpelcnt: Raster image pel count	NA	NA	NA	NA	NA	NA	NA	NA	
rdensty: Raster image density	NA	NA	NA	NA	NA	NA	NA	NA	
didfilid: Data Item Description file identifier.	NA	NA	NA	M	NA	NA	NA	NA	
doccls: Document Security Label	M	M	M	M	M	M	M	M	
notes: Notes	M	M	M	M	M	M	M	M	

Legend:

O - Optional

M - Mandatory

(I) - Mandatory only when file is a technical publication illustration

\* - Must be identical to the corresponding Declaration File Record

NA - Not Applicable

Note: If no data for a mandatory field, the word "None" must be entered

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5.1.4.5 CGM data file header records. The file header records for the CGM data files shall contain the mandatory records shown in table II.

5.1.4.6 PDL file header records. The file header records for a PDL data file shall contain the mandatory records shown in table II.

5.1.4.7 Gray scale header records. The file header records for gray scale (half tone) illustration files shall contain the mandatory records shown in table II.

5.1.4.8 Special word file header records. The file header records for the special word files shall contain the mandatory records shown in table II.

5.1.4.9 Output specification data file header records. The file header records for the output specification data files shall contain the mandatory records shown in table II.

5.1.5 Product data document identifier record format. The following shall be the format and content of the srcdocid: header record of product data files when so specified by the contract or other form of agreement. This format facilitates the transfer of information included with aperture cards and has application when the product data originates in aperture card form or is required for subsequent issue in that form. The "source system document identifier" record for product data files (e.g., the srcdocid: header record of IGES and raster data files) shall be constructed of 128 bytes, with 69 of the bytes as defined in table III. The remaining bytes shall be used as identified by the contract or other form of agreement.

5.2 Media options. This section specifies the details of the transfer media preparation.

5.2.1 Magnetic tape. The tape format for delivery of the files to a destination system shall be written in accordance with ANSI X3.27-1987. The tape volume labels and file labels shall comply with Level 3 or Level 4 of that standard. Acceptable tape densities are 1600 and 6250 CPI only on 9-track tapes in accordance with ANSI X3.39-1986 and ANSI X3.54-1986. Multi-volume tapes are possible, and several documents can be delivered on a set of tape volumes; however, to limit confusion and error, a tape set should be limited to three volumes except when a single technical document requires more than three volumes. A label containing text identifying the tape contents shall be affixed to the tape reel.



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TABLE III Source system document identifier (srcdocid:) record content.		
Position	Data Element Name	Content
1-10	Record Identifier	The character string, srcdocid:, including a "space" character in the tenth position following the colon.
11-12	Document Type	Code identifying the document type that this image represents or is a part of. Use the "type code" specified in MIL-STD-804 unless otherwise specified by the contract or other form of agreement.
13-27	Document Identifier	Alpha numeric sequence assigned by the originating organization or as identified by the contract. This must be an identifier unique to the assigning organization. (e.g., drawing number, parts list number, document identifier for a Defense Standardization Program document).
28-32	CAGE Code	The Code assigned to uniquely identify a "Commercial and Government Entity." This code when appended to drawing numbers, parts list numbers, and other such documents provides a "unique document identification" in the Defense Standardization Management system. Appended to a Defense standardization document identifier, this code identifies "the location of the responsible agent."
33-34 a, rj	Revision Letter	Sheet/image revision level - if there are multiple sheets/images to the document, then sheet/image one will identify the highest revision level of the set. If the revision level is numeric, convert to an alpha using table IV.

Legend:

rj = right justified;

$n$  = numeric with leading zeroes;  
 $a/n$  = alpha/numeric followed by blanks.

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TABLE III Source system document identifier (srcdocid:) record content. (continued)		
Position	Data Element Name	Content
35-36 a/n	Accompanying Document Kind	Code identifying the type of document accompanying the document identified in positions 11-34. Use the "type code" specific in MIL-STD-804 unless otherwise specified by the contract or other form of agreement. (This is used to identify accompanying and related ECN's, etc.)
37-43 a/n	Accompanying Document Identifier	Alpha numeric sequence assigned by the originating organization, or as identified by the contract or other form of agreement. This must be an identifier unique to the assigning organization (e.g., drawing number, parts list number, document identifier for a defense standardization document).
44 a	Accompanying Document Revision	Accompanying document revision level - if the revision level is numeric, convert Letter to an alpha using table V.
45-48 a/n	Weapon System Code	Code assigned to the weapon system by the contract.
49-52 n	Image Number	Number assigned to the image in accordance with table V.
53-56 n	Total Number of Images	The total number of file images per individual sheet/page of a document shall be used - see table V, (for Army this equals number of images for a specific drawing revision level).
57	Data Rights	A code identifying the data rights associated with the document. This code will be assigned by the contract or other form of agreement.

Legend:

`rt` = right justified  
`n` = numeric with leading zeroes;  
`a/n` = alpha/numeric followed by blanks.



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TABLE III Source system document identifier (srcdocid:) record content. (continued)		
Position	Data Element Name	Content
58-59	Control Activity	Code identifying the activity responsible for the configuration control of the document. Use the code listed in MIL-HDBK-331 for the control activity identified by the contract or other form of agreement.
60	Format Code	Identify the format code (H or T) format as defined in MIL-STD-804) to be used when punching the data of this record on an aperture card.
61	Security Classification	Identify the security classification assigned to the sheet/image. Use the appropriate code as identified by the contract or other form of agreement.
62-65 rj	Sheet Number	A document sheet/page identification shall be used - See Table V.
66-67 rj	Drawing Size	Identify the drawing size. (Acceptable size codes are A to K and A4 to A0).
68	Distribution	Identify the distribution code in accordance with MIL-STD-1806.
69	Data Control Code	Identify the export data control code in accordance with MIL-STD-1806.

Legend:

rj = right justified;  
 n = numeric with leading zeroes;  
 a/n = alpha/numeric followed by blanks.



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TABLE IV Numeric to alpha conversion chart.

N	A	N	A	N	A	N	A	N	A
1	A	45	BE	89	DJ	133	FN	177	HU
2	B	46	BF	90	DK	134	FP	178	HV
3	C	47	BG	91	DL	135	FR	179	HW
4	D	48	BH	92	DM	136	FT	180	HY
5	E	49	BJ	93	DN	137	FU	181	JA
6	F	50	BK	94	DP	138	FV	182	JB
7	G	51	BL	95	DR	139	FW	183	JC
8	H	52	BM	96	DT	140	FY	184	JD
9	J	53	BN	97	DU	141	GA	185	JE
10	K	54	BP	98	DV	142	GB	186	JF
11	L	55	BR	99	DW	143	GC	187	JG
12	M	56	BT	100	DY	144	GD	188	JH
13	N	57	BU	101	EA	145	GE	189	JJ
14	P	58	BV	102	EB	146	GF	190	JK
15	R	59	BW	103	EC	147	GG	191	JL
16	T	60	BY	104	ED	148	GH	192	JM
17	U	61	CA	105	EE	149	GJ	193	JN
18	V	62	CB	106	EF	150	GK	194	JP
19	W	63	CC	107	EG	151	GL	195	JR
20	Y	64	CD	108	EH	152	GM	196	JT
21	AA	65	CE	109	EJ	153	GN	197	JU
22	AB	66	CF	110	EK	154	GP	198	JV
23	AC	67	CG	111	EL	155	GR	199	JW
24	AD	68	CH	112	EM	156	GT	200	JY
25	AE	69	CJ	113	EN	157	GU	201	KA
26	AF	70	CK	114	EP	158	GV	202	KB
27	AG	71	CL	115	ER	159	GW	203	KC
28	AH	72	CM	116	ET	160	GY	204	KD
29	AJ	73	CN	117	EU	161	HA	205	KE
30	AK	74	CP	118	EV	162	HB	206	KF
31	AL	75	CR	119	EW	163	HC	207	KG
32	AM	76	CT	120	EY	164	HD	208	KH
33	AN	77	CU	121	FA	165	HE	209	KJ
34	AP	78	CV	122	FB	166	HF	210	KK
35	AR	79	CW	123	FC	167	HG	211	KL
36	AT	80	CY	124	FD	168	HH	212	KM
37	AU	81	DA	125	FE	169	HJ	213	KN
38	AV	82	DB	126	FF	170	HK	214	KP
39	AW	83	DC	127	FG	171	HL	215	KR
40	AY	84	DD	128	FH	172	HM	216	KT
41	BA	85	DE	129	FJ	173	HN	217	KU
42	BB	86	DF	130	FK	174	HR	218	KV
43	BC	87	DG	131	FL	175	HR	219	KW
44	BD	88	DH	132	FM	176	HT	220	LY

- Notes:
1. N-Numeric; A-Alphabetic
  2. Letters I,O,Q,S,X, and Z are not to be used

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TABLE V Determination of numeric entries for columns 39-80. (Part one of three)	
CONDITION	COLUMNS 39-42 (FILE NUMBER)
1. WHEN AN ENGINEERING DOCUMENT CONTAINS ONLY ONE SHEET AND REQUIRES ONLY A SINGLE FILE. (SEE FIGURE 2 CONDITION 1 FOR EXAMPLE)	USE 0001
2. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE SHEETS THAT ARE SEQUENTIALLY NUMBERED 1, 2, 3, 4 OR A, B, C, D AND SO FORTH AND ARE CONTAINED IN ONE FILE PER SHEET (SEE FIGURE 2 CONDITION 2 FOR EXAMPLE)	USE 0001 FOR SHEET 1 OR A USE 0001 FOR SHEET 2 OR B USE 0001 FOR SHEET 3 OR C USE 0001 FOR SHEET 4 OR D
3. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE PAGES THAT ARE NOT SEQUENTIALLY NUMBERED AND EACH PAGE IS CONTAINED IN A SINGLE FILE. SUCH AS: A. TITLE PAGE, i, ii, 1.1, 1.A, 1.B; PAGE 2, 2.1, 2.2; PAGE 3; AND SO FORTH (SEE FIGURE 2 CONDITION 3 FOR EXAMPLE)	USE 0001 FOR TITLE PAGE USE 0002 FOR PAGE i USE 0003 FOR PAGE ii USE 0004 FOR PAGE 1-1 USE 0005 FOR PAGE 1.A USE 0006 FOR PAGE 1.B USE 0001 FOR PAGE 2 USE 0002 FOR PAGE 2.1 USE 0003 FOR PAGE 2.2 USE 0001 FOR PAGE 3
4. WHEN TWO OR MORE SHEETS OF AN ENGINEERING DOCUMENT ARE CONTAINED IN ONE FILE (SEE FIGURE 2 CONDITION 4 FOR EXAMPLE).	USE 0001 FOR EACH FILE REQUIRED
5. WHEN ENGINEERING DOCUMENTS REQUIRE BOTH SINGLE AND MULTIPLE FILES PER SHEET. (SEE FIGURE 2 CONDITIONS 5 FOR EXAMPLE). (F1, F2, & F3 REPRESENT A SINGLE SHEET DOCUMENT THAT MUST BE DIVIDED BETWEEN 3 FILES TO INCLUDE THE WHOLE PAGE AT A USABLE SCALE.)	USE 0001 FOR FIRST FILE USE 0001 FOR F1 USE 0002 FOR F2 USE 0003 FOR F3



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TABLE V Determination of numeric entries for columns 39-80. (Part two of three)	
CONDITION	COLUMNS 43-46 (NUMBER OF FILES)
1. WHEN AN ENGINEERING DOCUMENT CONTAINS ONLY ONE SHEET AND REQUIRES ONLY A SINGLE FILE. (SEE FIGURE 2 CONDITION 1 FOR EXAMPLE)	USE 0001
2. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE SHEETS THAT ARE SEQUENTIALLY NUMBERED 1, 2, 3, 4 OR A, B, C, D AND SO FORTH AND ARE CONTAINED IN ONE FILE PER SHEET (SEE FIGURE 2 CONDITION 2 FOR EXAMPLE)	USE 0001 FOR SHEET 1 OR A USE 0001 FOR SHEET 2 OR B USE 0001 FOR SHEET 3 OR C USE 0001 FOR SHEET 4 OR D
3. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE PAGES THAT ARE NOT SEQUENTIALLY NUMBERED AND EACH PAGE IS CONTAINED IN A SINGLE FILE. SUCH AS: A. TITLE PAGE, i, ii, 1.1, 1.A, 1.B; PAGE 2, 2.1, 2.2; PAGE 3; AND SO FORTH (SEE FIGURE 2 CONDITION 3 FOR EXAMPLE)	USE 0006 FOR TITLE PAGE USE 0006 FOR PAGE i USE 0006 FOR PAGE ii USE 0006 FOR PAGE 1-1 USE 0006 FOR PAGE 1.A USE 0006 FOR PAGE 1.B USE 0003 FOR PAGE 2 USE 0003 FOR PAGE 2.1 USE 0003 FOR PAGE 2.2 USE 0001 FOR PAGE 3
4. WHEN TWO OR MORE SHEETS OF AN ENGINEERING DOCUMENT ARE CONTAINED IN ONE FILE (SEE FIGURE 2 CONDITION 4 FOR EXAMPLE).	USE 001 FOR EACH FILE REQUIRED
5. WHEN ENGINEERING DOCUMENTS REQUIRE BOTH SINGLE AND MULTIPLE FILES PER SHEET. (SEE FIGURE 2 CONDITIONS 5 FOR EXAMPLE). (F1, F2, & F3 REPRESENT A SINGLE SHEET DOCUMENT THAT MUST BE DIVIDED BETWEEN 3 FILES TO INCLUDE THE WHOLE PAGE AT A USABLE SCALE.)	USE 0001 FOR FIRST FILE USE 0003 FOR F1 USE 0003 FOR F2 USE 0003 FOR F3

31 (continued)



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TABLE V Determination of numeric entries for columns 39-80. (Part three of three)	
CONDITION (SHEET NUMBER)	COLUMNS 78-80
1. WHEN AN ENGINEERING DOCUMENT CONTAINS ONLY ONE SHEET AND REQUIRES ONLY A SINGLE FILE. (SEE FIGURE 2 CONDITION 1 FOR EXAMPLE)	USE 001
2. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE SHEETS THAT ARE SEQUENTIALLY NUMBERED 1, 2, 3, 4 OR A, B, C, D AND SO FORTH AND ARE CONTAINED IN ONE FILE PER SHEET (SEE FIGURE 2 CONDITION 2 FOR EXAMPLE)	USE 001 FOR SHEET 1 OR A USE 002 FOR SHEET 2 OR B USE 003 FOR SHEET 3 OR C USE 004 FOR SHEET 4 OR D
3. WHEN AN ENGINEERING DOCUMENT CONTAINS TWO OR MORE PAGES THAT ARE NOT SEQUENTIALLY NUMBERED AND EACH PAGE IS CONTAINED IN A SINGLE FILE. SUCH AS: A. TITLE PAGE, i, ii, 1.1, 1.A, 1.B; PAGE 2, 2.1, 2.2; PAGE 3; AND SO FORTH (SEE FIGURE 2 CONDITION 3 FOR EXAMPLE)	USE 001 FOR FIRST PAGE USE 001 FOR PAGE i USE 001 FOR PAGE ii USE 001 FOR PAGE 1-1 USE 001 FOR PAGE 1.A USE 001 FOR PAGE 1.B USE 002 FOR PAGE 2 USE 002 FOR PAGE 2.1 USE 002 FOR PAGE 2.2 USE 003 FOR PAGE 3
4. WHEN TWO OR MORE SHEETS OF AN ENGINEERING DOCUMENT ARE CONTAINED IN ONE FILE (SEE FIGURE 2 CONDITION 4 FOR EXAMPLE).	USE 001 FOR FIRST FILE. USE LOWEST APPLICABLE SHEET NUMBER CONTAINED IN THE REMAINING FILES
5. WHEN ENGINEERING DOCUMENTS REQUIRE BOTH SINGLE AND MULTIPLE FILES PER SHEET. (SEE FIGURE 2 CONDITIONS 5 FOR EXAMPLE). (F1, F2, & F3 REPRESENT A SINGLE SHEET DOCUMENT THAT MUST BE DIVIDED BETWEEN 3 FILES TO INCLUDE THE WHOLE PAGE AT A USABLE SCALE.)	USE 001 FOR FIRST SHEET USE 002 FOR F1 USE 002 FOR F2 USE 002 FOR F3

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FIGURE 2. Image content examples.

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5.2.1.1 Volume identifier. The tape volume identifier shall consist of a six-character name; the first four characters are arbitrarily assigned to identify the set and the last two are the tape number in the set. The tape number for the first tape may be space characters or "01"; the subsequent tape numbers shall be numbered sequentially, "02" and up. The character set for the labels shall be limited to the ASCII numbers 0-9 and the upper-case letters. The first character shall not be a number. The owner and accessibility fields of the volume label will be ignored when the tape is read into the destination system.

5.2.1.2 Volume tape set example. Following is an example of Volume 1 of a hypothetical tape set written in ANSI Level 3 format with two documents on the tape. Beginning at the physical beginning of tape (BOT) mark on the tape shall be the Volume header (VOL1). Next shall be the two levels of file headers (HDR1, HDR2) for the first file (Declaration file: D001), followed by a tape mark (TM). The blocks of the first declaration file follow, trailed by another tape mark, the end of file data (EOF1, EOF2) and another tape mark. The headers, tape marks, declaration file, and end of file are then written for another document, followed by the two text files for that document. Labels HDR3-9, EOF3-9, EOVS3-9 may be written by the sending system. The destination system must be able to ignore these labels if the destination system cannot process them. When the physical end of tape (EOT) mark is reached, the end of volume (TM, EOVS1, EOVS2, TM and TM) shall be written. Any further files for the two documents would be on volume two or three of the tape set. In actuality, many more files should fit on a single tape than shown in this example.

5.2.1.3 Declaration file. The declaration file shall be written in sequential variable length records. Each record has a dedicated use, and each record is required. All the data shall be in ASCII character format. The records shall be ANSI type D variable length records with a maximum record length of 256 bytes and block lengths of 2048 bytes. (Do not include the Record number in the record field.) Whenever a declaration file name is defined, that file name (character string) shall be placed in the 17 character ANSI file label field.

5.2.1.4 Data files. The ANSI record type, record length and block length required for the various data files shall be in accordance with table VI. The appropriate file header records defined in paragraph 5.1.4 shall be written in the first physical block of the file with the block padded to the appropriate block size. The second and subsequent blocks of the file shall contain the file data encoded in the appropriate data form for the type of data file being recorded on tape.



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TABLE VI Data File Records Format					
CODE LTR.	USED IN	ANSI	RECORD	RECORD	BLOCK
NAME	DATA FILE TYPE	TYPE	LENGTH	LENGTH	LENGTH
T	TEXT FILE	D	256	2048	
G	DTD FILE	D	256	2048	
H	FOSI FILE	D	256	2048	
Q	IGES FILE	F	80	2000	
R	RASTER FILE *	F	128	2048	
C	CGM FILE	F	80	2000	
E	EDIF FILE	AS SPECIFIED BY CONTRACT			
I	IPC FILE	AS SPECIFIED BY CONTRACT			
V	VHDL	F	80	1920	
X	SPECIAL WORD FILE	AS SPECIFIED BY CONTRACT			
P	PDL FILE	AS SPECIFIED BY CONTRACT			
Z	GREY SCALE DATA	AS SPECIFIED BY CONTRACT			
A	CONTRACT DEFINED				

\* The second and succeeding physical blocks of a raster file shall contain the image data encoded according to MIL-R-28002. All the data header records shall be written in the first physical block of the file, with the block padded to the appropriate size. All fixed length blocks within a file are padded out to the desired length by the use of circumflex accent ("^") characters (position 5/14 of the ASCII table). Refer to 6.3.4 of ANSI X3.27.

5.2.2 Diskettes and Optical disk. Five and 1/4 inch and 3 1/2 inch magnetic media diskettes, Write Once Read Many (WORM) optical disks, and CD-ROM disks are alternative physical media for transferring technical information in digital form. Presently, only MS-DOS PC-based CD-ROM systems are standardized, while WORM interchange requires the same vendor sending and receiving

hardware. Within DoD, an application is being pursued to use five-and-a-quarter (5-1/4) inch WORM disks as a transfer and storage



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medium for digitized technical data accessed by desktop workstations. In this application, the optical disk format being utilized is consistent with that of MS-DOS. Information relating to the optical disk directory structures being used in the application follows.

5.2.2.1 Diskette and Optical Disk Directory Structure. The sub-directory structure which shall be used here is based on naming conventions for declaration files and data files as specified in 5.1.1.1 and 5.1.3, respectively. For transfers involving multiple sets of files, sub-directories on the DOS-formatted WORM are structured to allow no more than one hundred data files per sub-directory. This is achieved through the following sub-directory organization and naming conventions:

- a. The name of the first-level sub-directory shall be to the first two characters of the name of the declaration file relevant to the document(s) being exchanged;
- b. The name of the second-level sub-directory shall be the second two characters of the declaration file name;
- c. The third-level or data file sub-directory name shall be the first two characters of the name of the data file being exchanged; and
- d. Within the third-level sub-directory, each file name shall be the complete name, as defined in 5.1.1.1 and 5.1.3 of each data file being exchanged

Figure 3 illustrates how the above directory structure would be established to facilitate access to a large collection of raster documents being transferred on a 5-1/4 inch WORM disk. In this example, the declaration file is named D001, and the data file names start with D001R001 and advance in sequence through D001R399.

5.2.3 Encapsulation within Electronic Data Interchange (EDI) Transactions. The data shall be prepared and transmitted in accordance with the requirements of the proposed ANSI Draft Standard for the 841 Specifications/Technical Information Transaction Set, when required by contract or other form of agreement.



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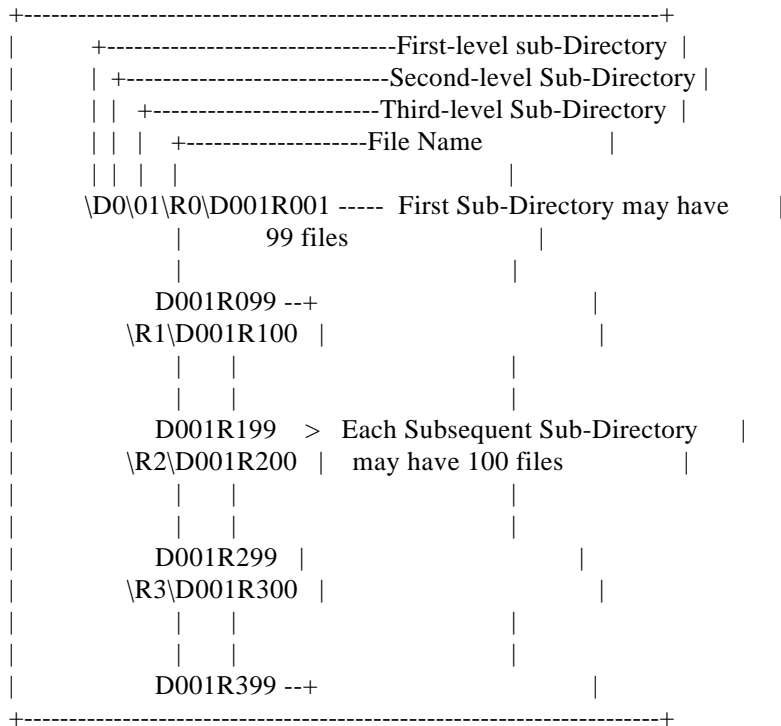


FIGURE 3. Example directory structure for diskette and optical disk media.

5.2.4 Transmission by GOSIP Compatible Network. The data shall be prepared and transmitted in accordance with the requirements of FIPS PUB 146 - Government Opens Systems Interconnection Profile (GOSIP) as provided by contract or other form of agreement.

5.3 Packaging. It shall be the responsibility of the sender of the digital document to use best commercial practices in the packaging of physical media used to transfer the document.

5.3.1 Encoded magnetic computer media. A packing slip showing the names and volume numbers of each reel or disk shall be included in each package. If the media is magnetic tape, a packing slip shall be affixed to each reel of tape and shall indicate the recording density, 1600 or 6250 CPI. A printed listing of the content of included declaration files shall be on the packing slip or attached to it.

5.3.1.1 Protection. Encoded tapes, disks, and other electromagnetically inscribed information transfer media shall be protected against exposure to the close proximity of electric motors, magnets, and scanning devices. Such exposure may cause total or partial loss of the encoded data.

5.3.1.2 Packaging. Encoded magnetic computer tapes and disks shall be placed in a barrier bag or be wrapped in barrier sheet material.

The barrier material or bag shall conform to the Type I Class 2 material of MIL-B-131, with at least one of its laminants

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containing aluminum foil. The package then shall be placed in an appropriate shipping carton. The exterior packaging shall conform to ASTM D 3951.

5.3.1.3 Marking. Encoded magnetic computer tape or disk shipping containers shall be conspicuously labeled with a warning as shown in figure 4.

5.3.2 Other computer media. Additional instructions for protection, packing or marking will be specified by the contract or other form of agreement if applicable.

FIGURE 4. Example of a warning label.



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### 6 NOTES

6.1 Intended use. This standard directs the application of standards and specifications which are intended to provide the capability for reliable and economical transfer of various digital representation forms of technical information. The standards implemented herein have been chosen because they are widely supported and accepted by national or international standards bodies. Because of the rapidly evolving technology, many of these standards are themselves evolving significantly, and will be further implemented in future revisions of this standard.

6.2 Document digital data forms. The term document has a wide range of meanings, and to avoid confusion the meanings need to be clearly defined as they are applied in this military standard. As used herein, the term "document" applies to the information content of a variety of different types of technical data (see definition of document in section 3.1). However, that information content can be transferred in different forms which in turn can be processed to different degrees by the recipient and which have different intended uses and applications. Two distinctly different forms of the digital representation of technical information are:

- a. Document images. Traditional information products, formatted for human interpretation, that can be acquired in either hard copy or digital form. The principal uses of the document image are storage and retrieval for viewing and annotation or excerpting. Raster data files and PDL data files are of this type.
- b. Processable data. Digital source data from which document images can be produced. The data itself can be updated or transformed for other applications. IGES product data files, CGM vector data files, and SGML textual data files are of this type.

Document images and processable data are two different forms of digital data in which "documents" (information content) can be exchanged. This military standard addresses both categories of "documents."

6.3 Destination system. Throughout this standard, the phrase "destination system" is used in lieu of any specific designation of a military service or DOD agency. This convention does not preclude this standard from being used for information transfer to non-DOD agencies and private sector organizations.

6.3.1 Telecommunications. GOSIP will be able to interoperate with the DOD protocols; it is, therefore, encouraged that acquisitions of telecommunication products require the delivery of systems that satisfy the data communication protocol specifications of GOSIP.





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is available from the National Institute of Standards and Technology, Computer Systems Laboratory, Gaithersburg, MD 20899.

6.4 Subject term (key word) listing. The following subject terms (key words) are applicable:

- Initial Graphics Exchange Specification
- Language, Page Description
- Manuals, technical
- Publications, technical
- Publishing, electronic
- Standard Generalized Markup Language

6.5 Changes from previous issue. Asterisks or vertical lines are not used to identify the changes effected in this revision due to the extensiveness of the changes.



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VHDL ELECTRONIC PRODUCT DATA

10 GENERAL

10.1 Introduction. This Appendix contains the format and content preparation instructions for VHDL data. VHDL documentation contains behavioral and structural descriptions of an electronic system, subsystem, or device. The primary purpose of these data items is to document hardware designs in a machine processable, simulatable, and hierarchical format.

10.2 Scope. This Appendix is a mandatory part of this standard and applies to the preparation for digital delivery of Functional Design Description, and Functional Description, application data files for Digital Electronic Product Items.\*\* of two Electrical/Electronic Item Product Data packages for digital delivery:

10.2.1 Functional Design Description Data Package. This deliverable describes the abstract or functional performance of the digital electronic product item without reference to detailed physical implementation; it replaces while expanding upon the Logic Diagram Drawing referenced in DOD-STD-100. The purpose of a functional design description data package is to provide a comprehensive adequate description of digital electronic products (at the integrated circuit or digital printed circuit board assembly level) for: design review by the program office; procurement of functionally equivalent parts; test program development; and a variety of other logistics activities. Higher levels of digital system integration (box or system) are generally described by their schematic diagram or network listing of interconnection between parts or assemblies (communicated by the common data elements document type), accompanied by functional design product description documents for the assemblies or parts, although an entirely digital box may be preliminarily described by a behavioral description.

These data packages consist of the following data elements:

- a. Common product description elements
- b. Behavioral description of digital electronics, to consist of:  
Algorithmic Description; Quantitative Performance (behavioral); Operating Range; Behavioral Simulation Data (including models.)
- c. Logical description of digital electronics, to consist of:  
Logical Structural Description; Logic Simulation Data (including models.)



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d. Timing Description (including rise, fall, delay and propagation times)

e. Test Vectors

10.2.2 Functional Description Data Package. The digital electronic product item functional description data package serves to communicate a wider range of product description information than the common descriptive document type, and would normally be initially delivered in conjunction with the Preliminary Design Review to be updated at Critical Design Review. Another delivery (to take place at the end of full scale development) would support development of test programs and other logistics activities. An additional delivery (to take place before full rate production) is required for documentation of all digital electronic components or assemblies for which reprourement or resupply might reasonably be expected. Specifically, this deliverable should apply to: Commercially Available Integrated Circuits (behavior, timing, and test vectors), Application Specific Integrated Circuits (behavior, structure, timing, and test vectors), and all Reprocureable Digital Printed Wiring Assemblies (behavior, and external timing).

10.2.3 Data Elements. Items b. through e. shall be delivered as independent descriptions; i.e. the timing description shall not be embedded with either the logical or behavioral description. The content of item a. may be embedded within other items. Unless otherwise specified by the program office, this document type shall be delivered in VHDL format.

## 20 GENERAL REQUIREMENTS

20.1 Digital Electronics Functional Design Description data files. Digital electronics functional design description data files shall be delivered in accordance with the VHDL product description and file format standard as defined in IEEE-STD-1076.

20.2 General Specification data files (System and box level of system integration). General specification data files data files shall be delivered in accordance with the VHDL product description and file format standard as defined in IEEE-STD-1076.

20.3 VHDL Documentation Content. VHDL documentation contains behavioral and structural descriptions of the hardware being documented and behavioral descriptions of the VHDL test benches required to demonstrate their functionality.

20.3.1 VHDL Module Hierarchy. A VHDL description for the hardware shall be a hierarchy of VHDL modules, analogous to the physical hierarchy of the hardware being documented. A VHDL module consists of a VHDL entity declaration, one or more behavioral VHDL bodies, and except for allowable leaf level modules, a structural VHDL

body. One VHDL module shall be defined for the entire system and one for each physical electronic unit (assembly, subassembly,

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integrated circuit, etc.) of the hardware system. VHDL modules should also be defined for important subsections or groupings of complex physical units (e.g., macrocells of a chip or boards defining a processor).

20.3.1.1 Allowable Leaf Level Modules. Leaf level modules are VHDL modules for which no VHDL structural body is required. The only permitted leaf level modules are:

- a. Modules selected from a Government list of leaf level modules referenced or contained in the contract.
- b. Modules corresponding to a collection of hardware elements which together exhibit a stimulus-response behavior, but whose interaction is best modeled at the electrical or physical level. Examples of such modules are digital logic gates, analog circuit blocks, and power supplies.
- c. Modules whose detailed design has not yet been completed but whose behavior is required as a delivery disclosure at specified times during the contract.

20.3.2 Entity declaration. The entity declaration for each module shall include an interface declaration, timing and electrical requirements for the behavior of the device, allowable operating conditions, component identification, and explanatory comments.

20.3.2.1 Interface declaration. The interface declaration for each entity shall describe all input and output ports. The interface description shall include information which relates each input and output port to a package pin number or connector pin number whenever such a correspondence exists. This information may be in the form of port attributes or port mapping statements which relate function port names with connector pin numbers.

20.3.2.2 Timing and electrical requirements. Timing and electrical requirements (e.g., setup and hold times or power supply voltage extremes) shall be expressed in such a manner as to cause the simulator to generate error messages should the requirement be violated during a simulation.

20.3.2.3 Operating conditions. Operating conditions are the physical and electronic environment in which physical components are designed to operate, such as temperature range, signal excursions, logic level definitions, maximum power dissipation, radiation hardness, etc. VHDL package declarations shall be used whenever operating conditions are common across a class of similar components.

20.3.2.4 Entity naming conventions. Names for VHDL entities shall

be traceable to the names of physical electronic counterparts whenever such a correlation exists.



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20.3.3 Behavioral body. A behavioral body is an abstract, high-level, VHDL description which expresses the function and timing characteristics of the corresponding physical unit. All user programmable registers shall be clearly identifiable in the simulation model. Test and maintenance functions which are part of the physical unit and are available to the user shall be included in the behavioral body. Data flow, procedural and structural constructs may be used for expressing behavior.

20.3.3.1 Decomposition of behavioral bodies. Structural decomposition of behavioral bodies shall be used only to show functional partitions which are not clear from the partitions of the corresponding structural body. When determining the appropriate level of hierarchical decomposition, ease of simulation and clarity of behavior should be kept in mind. For example, it may be appropriate to decompose a computer which is made up of several bit-slice microprocessors into composite arithmetic logic units and register files which span portions of several chips. However, decomposing it into Boolean logic primitives (e.g. AND/OR operators) would neither clarify the behavior of the system nor make it easy to simulate.

20.3.3.2 Timing Characteristics. Signal delays at output ports of the VHDL modules shall accurately model the behavior of the physical units corresponding to the VHDL modules. Best, worst, and nominal output delays shall all be included. More elaborate timing models which take into account other variables such as supply voltage or output loading may also be used.

20.3.3.3 Structurally dependent signal values. Signal values which are dependent on a particular structural implementation, such as scan path signatures, shall not be specified in the behavioral module.

20.3.4 Structural Body. A structural VHDL body is composed exclusively of interconnected lower level components. Structural bodies shall represent the physical implementation accurately enough to permit logic fault modeling and test vector generation. Structure which is created to support testing and maintenance such as scan paths shall be included in the VHDL structural description.

20.3.4.1 Structural naming conventions. For ease of schematic drawing correlation, and within the constraints of the lexical rules of VHDL, names for components and signals shall be the same as, or traceable to, their electrical schematic counterparts.

20.3.5 VHDL simulation support. VHDL test benches which simulate the correct behavior of each VHDL module required by the contract to be simulatable as a stand alone module shall be furnished and clearly distinguished from the VHDL modules representing the design

itself.

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20.3.5.1 VHDL test benches. A VHDL test bench is a collection of VHDL modules which apply stimuli to a module under test (MUT), compare the MUT's response with an expected output, and report any differences between observed and expected responses during simulation. VHDL configuration information required to simulate a MUT shall be included with the test bench.

20.3.5.2 Test requirement correlation. VHDL test benches shall be cross-referenced to the contractually required hardware test plans, specifications, and drawings.

20.3.5.3 VHDL test bench completeness. Every VHDL module of the hardware hierarchy shall be simulatable as a stand alone module and hence a corresponding VHDL test bench is required for every VHDL module of the hierarchy.

20.3.6 Error messages. Error messages generated anywhere in either the VHDL description of the actual hardware or the test bench should identify the requirement which has been violated and the name of the VHDL design unit in which the error occurred. Applicable VHDL design units include: entity declarations, structural and behavioral bodies, package declarations, package bodies, and configurations.

20.3.7 Annotations. VHDL design units shall include explanatory comments which augment the formal VHDL text to make the intent of the VHDL model clear. The following information is required:

- a. Any factors restricting the general use of this description to represent the subject hardware.
- b. General approaches taken to modeling and particularly decisions regarding modeling fidelity.
- c. Any further information which the originating activity considers vital to subsequent users of the descriptions.

20.3.8 Reference to origin. Included in the VHDL documentation shall be a list of VHDL modules new with this deliverable and a list of VHDL modules that have been used without change from VHDL documentation previously accepted by the Government under this contract or VHDL modules selected from the list of Government VHDL modules referenced in the contract. Those modules included from previously existing descriptions shall include:

- a. identification of originator or source;
- b. DOD approved identifier (if one exists);

c. design unit name/revision identifier.

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20.3.8.1 Revision management. VHDL design units, once accepted by the Government, shall be revised only with the approval of the Contracting Officer. A design unit revision history shall be included in comments on each revised design unit. (Refer to 30.2, "File #8). The revision history shall include: the state of revisions, the performing individual and organization, the rationale for the revision, a description of where the original design unit required modification, and the testing done to validate the revised model.

### 30 DETAILED REQUIREMENTS

30.1 Device design and test documentation. Digital Application-Specific Integrated Circuits (ASICs) shall be documented by means of structural and behavioral VHDL descriptions in accordance with MIL-STD-454, Requirement 64: Microelectronic Devices. Fault coverage shall be reported for the manufacturing-level logic tests for all digital microcircuits designed after 30 September 1988 in accordance with MIL-STD-454, Requirement 64: Microelectronic Devices.

30.2 VHDL documentation format. All VHDL documentation deliverables shall be machine readable ASCII files contained on the specific magnetic media and in the machine format required by the contract or other form of agreement. ASCII files are defined as those satisfying character set requirements of the VHDL Language Reference Manual. Each file delivered under contract shall be either a VHDL design file, whose entire contents conform to the requirements of the VHDL Language Reference Manual (including definition of comments), or an auxiliary information file, containing no VHDL design units. Design units which are new with this contractual deliverable shall not be contained in the same design file with design units which have been previously accepted by the Government. The sequential order of the files of the deliverable shall be:

File #1: Names of all files of the deliverable VHDL documentation, named in accordance with the originating host operating system; one file per record and nothing else (pad with trailing blanks.)

File #2: High-level prose overview of the VHDL description that cites contract, line item, Contract Data Requirements List sequence number, and summarizes the organization and content of the set of files.

File #3: Specification of a sequence for analyzing the VHDL design units of the deliverable that is consistent with the order of analysis rules in the VHDL Language Reference Manual.

File #4: List of VHDL modules which were selected from the

Government list of leaf level modules.

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File #5: List of VHDL modules which are revisions of modules previously accepted by the Government.

File #6: List of VHDL modules which originate with this VHDL module delivery.

File #7: List of associates VHDL modules with their corresponding test benches.

File #8 et seqq.: Auxiliary information files concerning the VHDL description files related VHDL description and VHDL design files. Auxiliary information files shall precede VHDL design files.





MIL-STD-1840B  
APPENDIX A

Custodians:                      Preparing Activity  
Army - CR    OSD-CL              Navy - SH(Project ILSS - 0041)  
Air Force - 24  
DLA - DH

Review activities:  
Army - AM  
Air Force - 01,02  
NSA - NS  
DCA - DC  
NASA - NA  
Others - NIST, DOE, GPO, NCS

User activities:  
OSD - IR  
Army - AL, AT, AV, EA, ER, GL, ME, MI, MR, SM, TE, TM  
Navy - AS, EC, OS, SA, YD  
Air Force - 11, 13, 14, 17, 18, 19, 68, 79, 99



